NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

SEDIMENT BASIN
(No.)
CODE 350

DEFINITION

A basin constructed to collect and store debris or sediment.

PURPOSES

- Preserve the capacity of reservoirs, wetlands, ditches, canals, diversions, waterways, and streams
- Prevent undesirable deposition on bottom lands and developed areas
- Trap sediment originating from construction sites or other disturbed areas
- Reduce or abate pollution by providing basins for deposition and storage of silt, sand, gravel, stone, agricultural waste solids, and other detritus

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where physical conditions or land ownership preclude treatment of a sediment source by the installation of erosion-control measures to keep soil and other material in place or where a sediment basin offers the most practical solution to the problem.

CRITERIA

Sediment basin design and construction shall comply with all applicable federal, state and local laws and regulations.

The capacity of the sediment basin shall equal the volume of sediment expected to be trapped at the site during the planned useful life of the basin or the improvements it is designed to protect. If it is determined that periodic removal of sediment will be practicable, the capacity may be proportionately reduced.

The design of dams, spillways, and drainage facilities shall be according to NRCS Conservation Practice Standards 378, Pond or 410, Grade Stabilization Structure or according to the requirements in TR-60, as appropriate for the class and kind of structure being considered.

All embankments and other construction areas, excluding the sediment storage pool, shall be seeded in accordance with NRCS Conservation Practice Standard 342, Critical Area Seeding, and mulched in accordance with Standard 484, Mulching.

Types. Three types of sediment basins exist.

Permanent sediment basins are used when the basins will be used longer than 2 years, or if the drainage areas are more than 5 acres. They usually have earthen embankments and/or excavated basins with mechanical spillways. Unless site specific design data shows lesser values for the specific material being targeted, the minimum detention time is 24 hours for the 10-year, 24 hour runoff event. The minimum sediment storage is 0.5 inch times the drainage area of the basin.

Temporary sediment basins are used where the basins will be used for periods of 2 years or less and the drainage areas are five acres or less. They usually have earthen embankments and/or excavated basins, and may have mechanical spillways, crushed stone or gravel outlets, or other appropriate outlets. A temporary basin having a drainage area of 5 acres or less, an expected life of 2 years or less, and a total embankment height of 5 ft or less may be designed according to the NRCS Conservation Practice Standard 638, Water and Sediment Control Basin. The structure shall be removed and the area stabilized when the upslope drainage area has been stabilized. Unless site specific design data shows lesser values for the specific material being targeted, the minimum detention time is 24 hours for the 2-year, 24 hour runoff event. The minimum sediment storage is 0.5 inch times the drainage area of the basin.

Temporary sediment barriers are used to trap sediment from construction or other disturbed areas where the barriers are needed for less than 2 years

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and the drainage areas are less than 2 acres. Temporary sediment barriers include synthetic fabric silt fences and other appropriate materials. Barriers should be removed when the sediment source has been permanently stabilized, and the area should be reshaped to conform to the existing grade and seeded.

The basin or barrier should be located to intercept sediment before it enters streams, lakes, and wetlands. The trap efficiency of the basin should be 70 percent or greater. Where high value property, important water bodies, or environmentally sensitive areas may be impacted, a trap efficiency of 80 percent or greater needs to be achieved. Basins may be normally ponded or normally dry.

For applications involving solid separation from feedlot runoff, see NRCS Conservation Practice Standard 784, Wastewater and Feedlot Runoff Control.

All disturbed areas shall be treated as soon as possible after construction ends to control erosion and prevent excess sediment from leaving the site.

Provisions shall be made for dewatering sediment pools if necessary for safety and vector control.

Fencing and other safety measures shall be installed as necessary to protect the public from floodwater and soft sediment.

Due consideration shall be given to good visual resource management.

Silt fence. The design of silt fences shall be in accordance with Minnesota Department of Transportation (MnDOT) specification 3886, Heavy Duty. The following information is copied from the 2000 edition of MnDOT Standard Specifications for Construction, pages 1077-1079, for convenience.

The silt fence shall conform to Table 1 and the following requirements.

Geotextile. The geotextile shall be uniform in texture and appearance and shall have no defects, flaws, or tears that would affect its physical properties. It shall contain sufficient ultraviolet rays (UV) inhibitor and stabilizers to provide a minimum 2-year service life during outdoor exposure.

Fastening and Sewing. When wire mesh is used, wire fasteners (hog rings) shall fasten the geotextile over the top of the mesh along the upper edge at a maximum spacing of 12 inches (305 mm). A minimum of 3 metal U-shaped clips or wire shall fasten the wire mesh and two layers of geotextile to the metal posts. When plastic mesh is used, the mesh baking shall be joined to the geotextile at the top with two rows of stitching. Geotextile shall protrude below the bottom edge of the plastic mesh to allow embedment. A minimum of 3 metal U-shaped clips or wire shall fasten the plastic mesh and geotextile to metal posts.

Posts. Each post shall be securely fastened to the geotextile by zip ties, clips or staples suitable for each purpose. Standard T metal posts with a welded plate shall be used. The maximum post spacing shall be 8 feet (2.4 meters).

Field Assembly. The geotextile of the silt fence shall be attached to the upstream side of the net backing. The bottom edge of the geotextile shall be buried at least 6 inches (152mm) deep in a vertical trench with the soil pressed firmly against the embedded geotextile.

Compact the soil immediately next to the silt fence fabric by operating the wheels of a tractor or skid steer on each side of the silt fence a minimum of two times.

CONSIDERATIONS

Large sediment basins may have an effect on the peak discharge rate from a watershed. Planners should consider this, and take steps to mitigate any potential negative effects this may have on riparian habitat downstream from the structure.

Visual aesthetics may be a concern, especially in urban or suburban areas. To address these concerns, the basin could be designed to blend with the surrounding topography, or plantings could be proposed to screen the view from surrounding homes or buildings.

The nesting success and survival rate of ground-nesting species will increase if mowing is delayed until after the nesting season.

Using native species for revegetation will increase habitat diversity.

Cultural resources issues need to be considered.

Fencing and other safety measures shall be installed as necessary to protect the public from water and soft sediment.

Due consideration shall be given to good visual resource management.

All permits required shall be obtained before the measure is installed.

PLANS AND SPECIFICATIONS

Plans and specifications for installing sediment basins shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

Provisions for controlling erosion and reducing sediment loss will be included. Specify rates of seed, mulch, and fertilizer, appropriate planting dates and method(s) of establishment.

OPERATION AND MAINTENANCE

The sediment basin will be inspected after major storms for damage that may affect its function and performance. Any damage will be promptly repaired.

Mow as needed to maintain adequate vegetative cover and to prevent the establishment of undesirable species.

Sediment deposits shall be removed when the sediment storage allotment is filled. Sediment removed from the basin shall be deposited in a suitable area and in such a manner that it will not cause pollution.

Table 1. Silt Fence Requirements

Description	Composite of mesh backing, posts, geotextile and fasteners, assembled on site	
Geotextile		
Type	Woven (122 cm)	
Width	48 inches	
Grab Tensile ASTM D 4632 (machine direction)	100 lbs minimum (45 kg)	
Apparent Opening Size ASTM D 4751	#20-70 sieve (0.85-.212 mm)	
UV Stability ASTM D 4355, 500 hours	70% minimum	
Top Fastening Component	6 inch (15 cm) overlap top of mesh backing	
Net Backing		
Material	Woven wire mesh	Plastic mesh
Steel Wire Gauge	14.5 minimum	-------
Max. Mesh Opening	6 inches (15 cm)	2 inches (50 mm)
Minimum Width	30 inches (76 cm)	30 inches (76 cm)
Posts		
Material	Steel T-post	
Minimum Size	1.26 lbs/lin feet (1.8 kg/m)	
Minimum Length	5 feet (1.5 m)	
Minimum Embedment	24 inches (610 mm)	
Maximum Spacing	8 feet (2.4 meters)	
Post Fastener	"U" shaped clips	"U" shaped clips
Minimum Fasteners per post	3	3